

**Exploration of attributes and sources of population-health awareness among US
college seniors**

Baishakhi Basu

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Committee:

Stephen A Bezruchka

James T Pfeiffer

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Baishakhi Basu

University of Washington

Abstract

**Exploration of attributes and sources of population-health awareness among
US college seniors**

Baishakhi Basu

Chair of the Supervisory Committee

Stephen A Bezruchka

Departments of Global Health and Health Services

Background: What do Americans think about their country’s health when compared to other nations? Research points out that Americans live shorter lives than the people in other rich countries. However, most Americans are unaware of either this anomaly or its underlying mechanisms. This qualitative study investigates the attributes and sources of awareness among young Americans about America’s current state of health.

Methods: We conducted semi-structured interviews of a purposeful sample of 12 college seniors at the University of Washington, from May to October of 2019. A thematic analysis was done. We explored the level of awareness of the college seniors about 1) health fundamentals 2) America’s current health status, 3) comparison to other rich countries, and lastly, 4) sources of health information.

Findings: College seniors displayed strong awareness of ‘downstream’ factors of population health conceptualized as obesity and mental disorders, stemming from a high-stress and bad-diet culture. However, awareness about ‘upstream’ factors of population health e.g. state and national policies, was lacking. Western and Northern European countries and Japan were perceived as

healthier nations. The college seniors obtained their health information from seven sources of awareness—online news apps, Facebook newsfeeds, educated peers, coursework, professional mentors, healthcare providers and political campaigns.

Conclusion: Inadequate awareness about the country’s health status might influence Americans’ engagement around voting, activism, and state and national policy reforms. Policies should therefore be developed to modify the sources of awareness, to facilitate improved public discourse and involvement in ‘upstream’ factors for improved national health.

INTRODUCTION

Extant research warns that Americans continue to live shorter and less healthy lives than people in other high-income countries, owing to causes still unresolved.^{1,2} Until 2018, for over 50 years, longevity of Americans declined as other nations continued to improve.^{3,4} Since 2010, untimely deaths in America have been clustering during the prime years of life (25-65 years), across all race and ethnicities.⁴ However, amidst all these health issues, existing assessments indicate that the level of health awareness among Americans is far from ideal. Population health awareness is vital to people's social and political actions responsible for improving national health.^{5,6} The information on Americans' insufficient level of awareness about their country's health status should urge policymakers, media and intellectuals to improve their reporting and dissemination.

Life expectancy at birth in the US: The most frequently used quantifiable indicator of a nation's health and wellbeing, life expectancy at birth, also written as e_0 , is the average number of years a newborn would live, if the existing mortality patterns stays constant.⁷ Infant and adult mortalities are two major components of life expectancy, which, along with morbidity and disability, comprise the Global Burden of Disease.⁸ A low e_0 , in developed nations, reflects a high burden of preventable deaths, resulting from high social inequality and lack of political will to improve social services for the poor.⁹ US's persistently low e_0 underscores inadequate public policies impacting maternal and child health, and lives in the American South and Midwest.¹ Despite being the nation with the highest investment into health care, US e_0 is 4.5 years shorter than Japan's.³

Despite US e_0 increasing from 1959 to 2014 (from 69.9 to 78.9), the rate slowed over time before declining from 2014 to 2017, while other nations' e_0 continued to improve.⁴ From 2015 to 2016, US e_0 decreased from 78.7 to 78.6, owing to excess preventable deaths among younger groups from unintentional injuries, suicide, with a decrease (0.2) in male e_0 to 76.1.¹⁰ From 2016 to 2017, US e_0 persisted at 78.6 without any improvement, with male e_0 dipping again by .1 while younger Americans took the toll of excess mortality.¹¹ Finally, from 2017 to 2018 the US e_0 increased by 0.1 to 78.7.² Mortality rates improved for all adult (>15 years) age groups, except for the age groups 35–44 and 55–64. Heart disease and cancer remained the top two causes of adult mortality, while suicide remained a leading cause. Congenital malformations, low birth weight,

and maternal complications remained top three leading causes of infant mortality (566.2 deaths per 100,000 live births) in 2018. With a trend starting in 2010, the all-cause mortality for midlife Americans (25-64 years) spiked in 2014 for all races, owing to ‘deaths of despair’—silent deaths from organ system diseases, drug overdoses, alcohol abuse, and suicides caused by ‘long-term economic malaise’.^{4,12}

Upstream determinants of health: In any society, “resources and capacity” flow from ‘upstream’ to ‘downstream’. Downstream factors are socio-economic conditions shaping health behaviors, health care access, neighborhood quality, social and living conditions, or access to infrastructure conducive to physical exercise. Sub-optimal downstream factors can increase the prevalence of lethal chronic disease, e.g. obesity, diabetes, mental disorders. Upstream factors, in contrast, refer to the socio-economic and political structures that are the root causes influencing the quality of those living conditions and social circumstances determining the population health outcomes.¹³ Upstream factors are extrinsic i.e. beyond individual control and are the policies responsible for economic security, job safety, educational opportunity, social harmony, racial equality, and group equity. Health awareness warrants understanding of both downstream and upstream determinants of individual, community, and population health outcome.

Upstream factors intentionally designed to deny the public of basic needs (e.g. food, shelter, healthcare) can be considered structural violence—an indirect and silent form of violence, often resulting in physical violence.¹⁴ Structural violence is a set of “large-scale social and economic structures in which affliction is embedded”¹⁵ e.g. worsening e₀ by “deaths of despair”.¹²

Reasons to explore a population’s awareness of its health: Public awareness is essential to bring about social change through changing public attitude on policy formation and political actions on inequality.⁶ In Britain, lack of awareness of ‘health inequality’ indicates inadequate public discourse, health promotion and media.¹⁶ Furthermore, preoccupation with their own hardship obstructed the disadvantaged groups from being aware of societal differences in health outcomes. The British public tend to support reduction of health, economic, and political inequalities rather than a complete elimination of social inequalities (rights, opportunities, access).⁶

Americans' misperceptions of the country's current health status may hinder investment into the public health programs, while overfunding the medical sector, causing uncontrolled healthcare costs worsening country's health and e_0 .¹⁷ Political knowledge through mass media has a sizeable influence on the voting-rate, public support, and collective actions.^{5,18} Mitigation of racial disparities in health and health care is only possible when the public becomes aware of relevant policies.¹⁹ Thus, exploring the level of population health awareness, especially among young adults, is crucial to inform policymakers about the necessity to influence this young community towards seeking upstream information regarding the nation's health outcome.

Current population health awareness in the US: Health awareness of Americans appears inadequate.^{17,19} Out of the 30 years increase in America's e_0 since 1900, only 5 years could be attributed to advances in medical care while remainder resulted from public health efforts e.g. preventative services and other factors.^{17,19,20} With the breakdown of social services, Americans tend to over-appreciate the contribution of healthcare towards e_0 , while remaining unaware of the threat that under-funded 'social services, public health interventions, and other non-healthcare determinants' pose on the country's e_0 . Low educational attainment appears to further weaken this perception.¹⁷ In 2012, 72% of men and 68% of women attributed the increase in US longevity to healthcare, followed by 10% of Americans who associated the increase with lifestyle, 9% with diet, 2% with education, and another 2% with sanitation.¹⁷

Fifty nine percent of Americans (89% of African Americans compared to 55% of whites) know that racial and ethnic disparities disproportionately affect African Americans and Hispanics or Latinos.¹⁹ A 2016 survey on a nationally representative sample of 1,549 U.S. adults found that 48% of Americans believed children's health was worse than it was 20 years ago, as compared to 31% who believed it had improved, and 20% perceiving no change.²¹ This public awareness points out a generational effect on the perception of existing health of adults and children. Fifty-three percent of Americans over the age of 65 perceived adult health in America to be better than it was 20 years ago, but 48% of 18 to 49-year-olds viewed the health of US adults to be worse now.²¹

Health-awareness among young US students: Among American youth, population level health information is not discussed until high school²²—while 75% of public high-school seniors correctly answered health-related problem-solving questions, only 54% could answer health

content questions. A focus group study of 11-19 y old students reported that, despite the internet being the primary source of health information, trusted peers and adults remained their preferred source.²³ Data from 17 college and university students (N=94,806) found that medical staff, health educators, faculty members, and coursework were the most believable but underutilized sources of health information. Information from parents were trusted and highly utilized.²⁴ Students who were older, female, full time, black and Hispanic used the above four health sources heavily. Thirty two percent of US medical students misperceived America's e₀ as the highest globally, while many (27%) were unaware of America having the highest healthcare cost per-person.²⁵ Forty percent of 1st and 4th year medical students underestimating "the numbers of uninsured" citizens, 54% of all medical students believed that their health policy curriculum was inadequate.

College seniors in the US will join the mainstream workforce to bolster the population through their labor, intellect, creativity, innovation, and leadership. Therefore, this group needs an accurate image of the current state of population health in their nation. This study aims to explore the awareness and attitudes of this group and identify the mechanisms by which this group gains its awareness about the quality of population health in the United States. The findings of this study may 1) promote cross-disciplinary and multisectoral collaborations to develop strategies and promote interventions to improve population health awareness among young Americans in order to reduce health inequities, and 2) urge policymakers to facilitate reforms of educational policies that can elevate population health awareness among college seniors.

Research question

In a purposeful sample of US college seniors, the proposed research explores the attributes and sources of awareness among college seniors about America's current population health.

Specific Aims

Through in-depth semi-structured interviews of college seniors, we investigated the level of awareness and rationale about 1) the factors that constitute their concept of health, 2) the current population health status of the US, 3) health outcomes in the US in comparison to Japan and Western European countries 4) their recall of sources of health information over the last two weeks.

METHODS

Ethical review

Institutional approval (minimal risk) was obtained from the University of Washington Human Subjects Division (UWHSD).

Study design

Between May and October 2019, we recruited undergraduate seniors of various majors enrolled fulltime in their final year of 4-year college programs at the University of Washington. The recruitment emails were sent via the undergraduate program coordinators of the eligible departments.

Setting

The interviews were conducted at the Paccar Hall cafeteria of University of Washington, Seattle Campus, at the participants' convenience. Interviews were conducted in American English. The interviewer, the Principle Investigator (PI) of this study, is a female graduate student of South Asian origin, with native proficiency in American English and adequate cultural competency for data collection.

Participants

We purposefully selected 12 participants using maximum variability sampling. Eligible participants 1) never took public health, medicine, nursing, public policy, sociology, law, or journalism courses that discuss population health in the US, 2) did not have a family member who teaches the above subjects, 3) were at least 18 years old, 4) not an international student.

Instrument development

Our interview guide (Appendix 1), was designed to probe for information on our four specific aims:

1. How do you perceive the concept of 'Health' in general?

2. What is your idea about health in America?
3. As compared to France, Germany, Sweden, and Japan, what is your perception of health in the US? Are they the same? if not are they better or worse? To what extent?
4. In the past 1-2 weeks how have you received any information about health in America?

Data collection

The PI conducted 12 semi-structured inductive interviews - 7 in May and June, 3 in July and August, and 2 in October of 2019. A consent form was emailed prior to their interviews followed by verbal consent to ensure that the participants knew 1) the selection criteria and the protection of anonymity, 2) the study ID number generated by UWHS and interviewer's contact information. The interviews, each lasting between 30-45 minutes, were audio recorded. The audio-recorded data did not carry any personal identifiers. Interview notes included the date and time of the interview, and the participant's ethnicity, sex and major(s), and the key responses capturing the chronological flow of the conversation.

Data analysis

Thematic analyses of the 12 interviews were accomplished through audio coding on Atlas.ti 7 that allows coding by creating quotations directly into the raw audio-file, without requiring transcripts. The data analysis was conducted by the PI, who developed the general coding scheme, selected coding terms, merged and fine-tuned codes. As prescribed by Kleiman²⁷, the PI listened to each recorded interview three times, to be acquainted with the data, before condensing it into themes. Primary codes were developed inductively using open coding by assigning thematic phrases to audio-quotations. Codes were further consolidated by using select-coding (assigning an existing open code to a new quotation) and merge-coding (merging two codes of same essence).

The analysis of 12 interviews (primary documents) resulted in 180 open codes merged into 140 codes, categorized under 18 subthemes (code-families) from which 4 major themes (families) emerged. We selected some verbatim quotes (Boxes 1 to 4) to illustrate the findings below.

RESULTS

Participant characteristics

The group of 12 participants was comprised of 6 white, 6 non-white, 4 male and 8 female students enrolled in 14 different undergraduate majors (Appendix 2).

Themes

1. Health is beyond a disease-free physical state

The following narrative (*Box 1*) constitutes the college seniors' understanding of health fundamentals:

Health is multidimensional and more than a disease-free physical body encompassing physical, mental, spiritual, environmental and community health, all intertwined. Health is living longer without illnesses, handicap, or physical discomfort. In addition to fewer illnesses, health is absence of obesity, a well-balanced diet, a good immune system, and a low stress lifestyle (exercise and adequate sleep). Health is a positive state of mind influenced by early psychological experiences. Health is access to healthcare e.g. medicine, vaccines, insurance, and annual checkup for chronic illnesses. Senior students conceptualized health through the daily lived experience of their own, family, friends, and community members and by observing people of different socio-economic statuses in their state of residence and through Facebook, Netflix, YouTube, movies, and international travels.

Box 1. Definitions of health

“health is [a] standard of being happy and unbothered”

“Health is early psychological experience.”

“Our community health affects individual health.”

“Standards of the society on happiness and health pushes how one thinks about health in a certain way.”

2. Americans are overweight and have poor mental health because of a high-stress-bad-diet culture.

College seniors think that Americans are unhealthy and are deteriorating physically, emotionally, and psychologically because of obesity and mental disorders, resulting from a high-stress-bad-diet culture, as described below:

Overview of health in America (Box 2): Despite more than 50% Americans struggling with obesity and many suffering from mental disorders, most Americans are unaware that they are unhealthy. Americans' poor long-term health stems from unhappiness, work-life imbalance and occupational monotony. Prioritizing money and education while lacking spirituality, Americans grapple with a disconnect between physical fitness and mental wellbeing. The budget cuts on essential social services makes life difficult for Americans, e.g., expensive education chains young Americans to debt. Young Americans' lack of mental health counselling and money-management skills further push them to poverty, depression, homelessness, and addictions.

Box 2. Overview of American's population health knowledge

[The] "idea is that it's a better country, so work hard."

"In the US, the pressure to be the best is preventing people to think about health."

"Even in good schools, students are walking zombies."

Americans "make too much sacrifice to just to achieve Maslow's lowest hierarchy".

Obesity in America: Besides genetics and diet, obesity is a result of stress in America related to a culture of sedentary life, conforming to capitalism, consumerism, and materialism. Obesity-related body-image issues cause psychological distress from social embarrassments. Americans live on alert against overweight, while a diet high in processed sugars remains a staple. A high-sugar diet may provide an insulin rush and a burst of energy, however, as people become over-weight, they suffer not only from low energy but also metabolic disorders shortening their lifespan.

High Stress culture of America: The major causes of stress in America are poverty, lack of family cohesion, and the pressure from family and workplace to have a perfect life. Mental disorders ultimately stem from the lack of access to basic needs; many Americans left without a place to sleep, many more battle poor health because of crime-prone and unsafe neighborhoods. Obesity and high-sugar diet can also affect mental health and stress-inducing body image issues.

Diet in America: America's poor diet has two components—large portion size and poor quality of food. Americans eat three big meals a day, with dinner being the biggest. Long mealtimes and

bonding over food are rare events. American diet depends on affordability and accessibility subject to geographical variability. Unaffordability of healthy food and lack of time and cooking skills compel many Americans to rely on cheaper food high in addictive sugar and fat.

Box 3. America's high-stress-bad-diet culture

"People are unhappy because of lack of work-life balance and repeated work."

"Homelessness makes other people nervous."

"In America, the unhealthy diet is a drug and it's a perfect storm for obesity."

[Americans are] "disease free but still not really healthy" because they are overweight.

"The reality is that our diet affects mental health because most neurotransmitters are produced in the gut."

"Family's dietary habit is more important than education level."

"Cycle between bad diet, obesity and mental stress continues."

"People don't have time to eat themselves, feed their children – no time to eat or prep (food)."

[When] "we catch an early bus to be in class on time – it's good for our mental health but then we do not eat breakfast and that physical health."

3. Western and Northern Europe and Japan are healthier than the US because of better diet, family ties, and accessible healthcare.

College senior were convinced that people in Western and Northern Europe and Japan enjoy healthier and happier lifestyles than Americans (*Box 4*).

People of Western and Northern Europe and Japan are thinner because of frequent consumption of vegetables and smaller meal size. Affordability of vegetables in those countries are attributable to increased local produce and decreased exported produce, both feasible because of their smaller population and low-level capitalism. In Western European countries, universal, affordable, and accessible healthcare reduce the prevalence of obesity and mental disorders. Additionally, their active lifestyle (e.g., walking everywhere), better nutritional awareness, low fast-food consumption, better digestion, better relationships, free education, and low stress level leads to better health. However, heavy smoking and alcohol consumption remain a social problem.

The Japanese have a longer average lifespan than Americans owing to a better family dynamic as it leads to a better diet. Japan has more elderly people than the US because the Japanese government takes better care of their children through better nutrition and healthcare. However,

the Japanese suffer from worse mental health than the US because of higher career expectations from high school years.

Box 4. Comparison with developed European countries and Japan

“Their cities are designed in a way to be more active. It’s not them choosing to be more healthy but it’s easier for them to be more healthy.”

“US sleeps more than Japan because they are overworked here.”

[For them] “family is more important than work.”

“EU put more thoughts to construct their meals. For them food is celebration of relationship.”

“Germany has better awareness about the diet that changes their body image.”

“At my work, many people don’t have the access to annual check-ups to prevent illnesses like diabetes and cancer.”

“Those countries provide cheaper, accessible healthcare coverage to every citizen”

4. The principal sources of health information comprised of 7 sources of awareness.

Analysis of the participants’ past two week’s recall data reveals that aside from direct observation of diverse US population groups, there are 7 sources of awareness (*Figure 1*) that consistently influence awareness of the college seniors: 1) digital news, 2) digital social media, 3) professional network, 4) social network, 5) academic training, 6) healthcare providers, and 7) political and health campaigns.

DISCUSSION

The discussion with the college seniors about America’s health remained focused on obesity and mental disorders, missing principal measures of population health—mortality rate, life expectancy or infant mortality. Societal issues e.g. income inequality, gender inequities, declining life expectancy, high maternal and childhood mortality, high prevalence of premature births, absence of paid maternity leaves, declining education budget, race-based violence, gun violence, excess military spending, biased tax structure, sub quality foster care, climate change were never brought up. Most importantly, college seniors were familiar with downstream factors but unaware of the upstream factors of population health (e.g. socio-economic and political structures governed by state and national level policies). Lack of holistic awareness might influence young Americans into adopting a reductionist view, overlooking population-level risk factors for their current state of health. Similar to a previous study²², our study points out that health awareness remains inadequate among non-public health college seniors. Consistent with existing research¹⁷, seniors

attributed Americans' bad health to lack of access to health care (e.g. affordability of medicine, insurance) and overlooked the contributions of social services and political policies. Similar to previous investigations²²⁻²⁴ for the seniors, the internet, rather than conventional mass media, served as the most utilized source of health-information, followed by health care providers, mentors, university faculty and educated peers, and parents.

Limitations: 1) Our qualitative study lacks the scope of a mixed methods study; 2) Majors in natural sciences, physical sciences, and engineering were under-represented; 3) Interviews were conducted over 5 months, so the participants differed in their graduation cohort by one quarter.

Strengths: 1) There was balanced variation in ethnicity and sex while maximizing variations in majors, while maintaining the commonalities around exposure to population health information; 2) participants with prior exposure to population health information through coursework or expert family members were excluded to remove classification bias; 3) Participation was strictly voluntary. 4) The subjects were unrelated and interviewed on different days.

CONCLUSIONS

College seniors from non-public health backgrounds displayed high levels of awareness on downstream health fundamentals, while remaining unaware of upstream health mechanisms and solutions. The seniors blamed poverty, stress, and diet for country's high burden of obesity and mental disorders. Western and Northern European countries and Japan were perceived as healthier nations because of universal and affordable healthcare. College seniors' level and attributes of health information were influenced by seven sources of awareness (online news apps, Facebook newsfeeds, parents and peers, undergraduate courses, professional mentors, health care providers and political campaigns) governed by upstream factors.

PUBLIC HEALTH IMPLICATIONS

The future policy recommendations of this research include:

1) More group-specific research is needed to understand why many Americans remain under-informed about American health.

2) Non-public health college students could learn about population health through core courses and interdisciplinary communications.

3) Population health could be well-discussed before college. Population health information should be incorporated into standardized tests (e.g. SATs), academic readings, and critical writing topics.

4) Pharmaceutical companies could be required to inform the public on contemporary trends of population health when advertising for drugs.

5) Doctors, the public health advocates, could disseminate health information to patients – through appropriate methods.

6) Facebook newsfeeds, as a major sources of health information among American youth, could highlight concepts of population health. Multisectoral arrangements would boost dissemination of information on population health to foster critical thinking.

7) Perhaps, the State of the Union speech could inform citizens about the country's health status in comparison to other nations.

8) Population health could be integrated into public conversation through diverse public and corporate events.

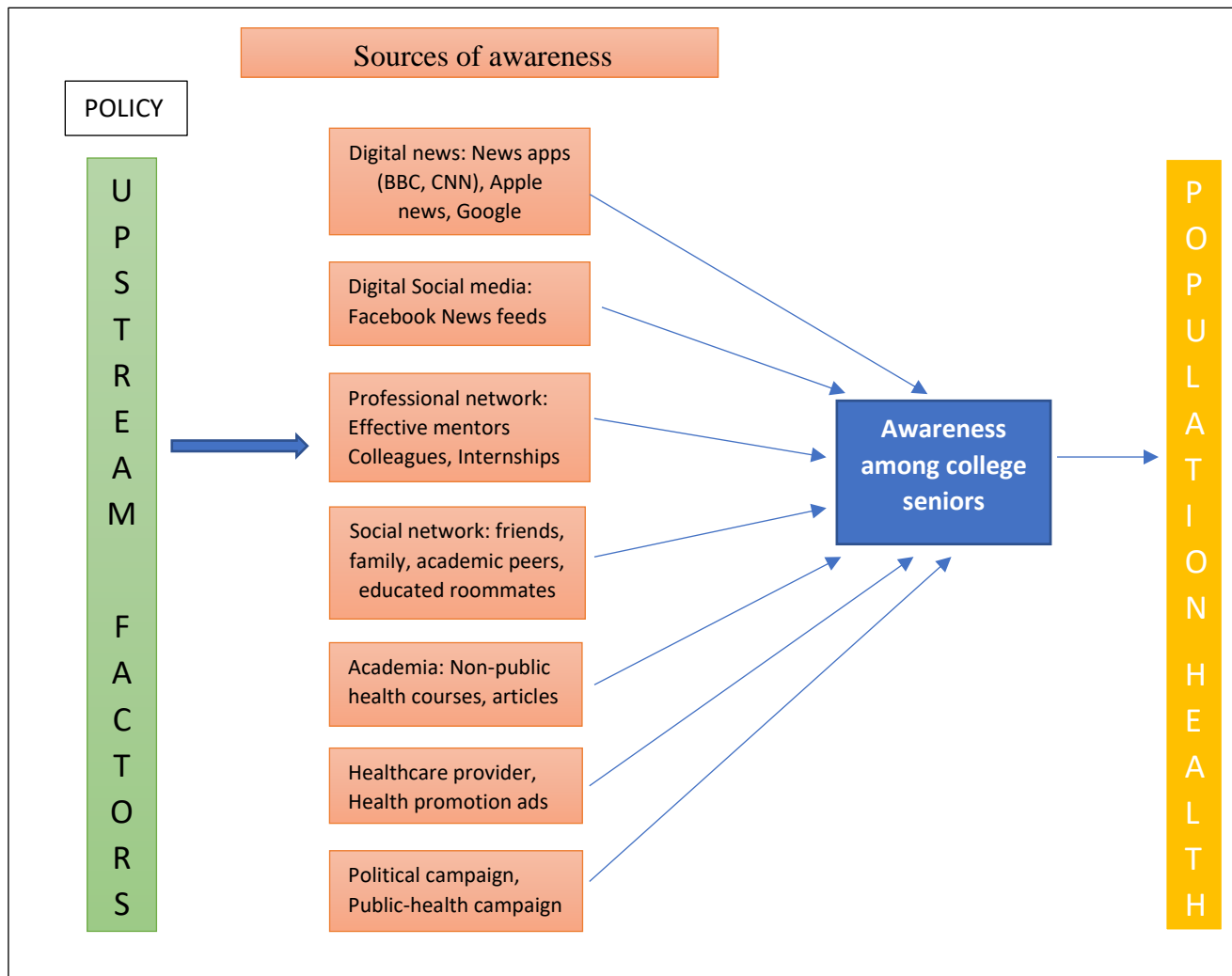
9) Population-health awareness could be considered as a component of health care services.

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Figure 1: Sources of population health-awareness: the conceptual framework



Appendix:

Append 1. Interview Guide

Subject# _____	Health awareness study	Date: _____	Time: _____
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- 1. How do you perceive the concept of 'Health' in general?***
- 2. What is your idea about health in America?***
- 3. As compared to France, Germany, Sweden and Japan, what is your perception of health in the US? Are they the same? if not are they better or worse? To what extent?***
- 4. In the past 1-2 weeks how have you received any information about health in America?***

Append 2: Sampling framework

